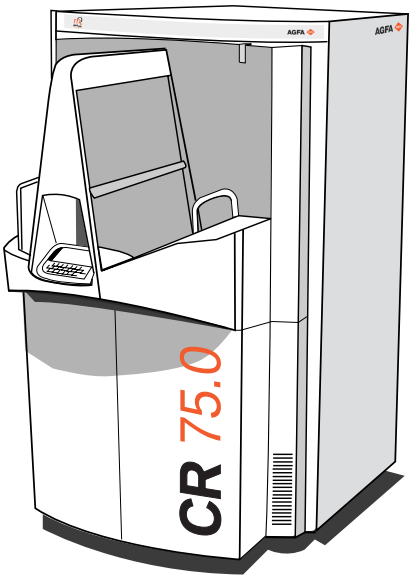
CR 75.0 Digitizer

User manual



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Chapter 1

Introducing the CR 75.0

This chapter draws attention to important safety precautions and introduces the CR 75.0.

- ❑ CR 75.0 intended use
- ❑ CR 75.0 features
- ❑ Safety precautions
- ❑ Safety compliance
- ❑ Operating modes
- ❑ The user interface
- ❑ Switching on the CR 75.0
- ❑ Switching off the CR 75.0
- ❑ Resetting the CR 75.0

CR 75.0 intended use

This device must only be used to scan exposed X-ray cassettes, containing an erasable image plate (IP). This device is part of a system, consisting of X-ray cassettes with erasable phosphor image plates, an identification station for the cassettes and a workstation where the resulting digital image information is further processed and routed. It is intended that this device is only operated in a radiological environment by qualified staff.

CR 75.0 features

The CR 75.0 scans the exposed ADC image plate, converts the information into digital data and automatically transfers the image to the image processing station for further processing and visualization.

The CR 75.0 requires but little manual interaction. All you have to do, after exposure and identification of the cassette, is to place it in the input buffer of the CR 75.0. You can deposit up to 10 cassettes of different sizes simultaneously in the input buffer. The Digitizer takes in the cassettes one by one. The Digitizer reads the demographic data and routing information from the memory chip in the cassette, opens the cassette, removes the image plate and scans the latent image by means of a sweeping laser beam.

Once the image is digitized, the cassette is returned to the output buffer to be used for new exposures. After a full Digitizer cycle, the plate has turned 180° in the cassette.

Depending on the X-ray intensity which has affected the phosphor during the exposure, more or less light will be emitted during laser scanning. The light is converted into an electrical signal. This signal is then converted into a digital bit stream. Once converted into digital form, the digitized image is transferred to the image processing station for further processing and visualization.

Further features of the CR 75.0 include:

- The CR 75.0 permits assigning the status ‘emergency’ to an image. An emergency image will be given priority by the image processing station.
- The CR 75.0 permits re-erasing an image plate before re-using it. In specific cases, this is necessary to prevent ghost images caused by previous exposures or stray radiation from interfering with the image of interest. You can erase a batch of up to 9 image plates.

Safety precautions

General safety instructions

- For software and other technical platforms, and/or in combination with any consumable, which constitute, after installation, a system for the interpretation of medical image data: such system is used by trained and qualified professionals. It is the user's responsibility to ensure that image quality, display quality, environmental lighting and other possible distractions are consistent with the clinical application.
  The user must be aware, that automatic collimation could possibly lead to misinterpretation of the image.
- Make sure that the CR 75.0 is constantly monitored in order to avoid inappropriate handling, especially by children.
- Only trained service personnel must make repairs. Only authorized service personnel must make changes to the CR 75.0.
- If there is any visible damage to the machine casing, do not start nor use the CR 75.0.
- If you want to connect the CR 75.0 with other devices, components or assemblies and if the technical data do not permit determining whether the combination with these devices, components or assemblies involves hazards, you must consult the respective manufacturers to avoid danger for operating personnel or the environment.
- Do not override or disconnect the integrated safety features.
- As is the case for all technical devices, the CR 75.0 must be operated, cared for and serviced correctly.
- If you don’t operate the CR 75.0 correctly or if you don’t have it serviced correctly, Agfa-Gevaert is not liable for resulting disturbances, damages or injuries.
- When installing the CR 75.0, care must be taken to ensure that there is either a mains plug or an all-cable disconnecting device in the internal installation fitted near the CR 75.0 and that it is easily accessible.
- If you notice conspicuous noise or smoke, disconnect the CR 75.0 immediately.
- Check that the mains voltage is within the specified range of the self adapting power supply of the machine.

Markings and labels

Always take into account the markings and labels provided on the inside and outside of the machine. A brief overview of these markings and labels and their meaning is given below.

	Safety warning, indicating that the CR 75.0 manuals should be consulted before making any connections to other equipment. The use of accessory equipment not complying with the equivalent safety requirements of this Digitizer may lead to a reduced level of safety of the resulting system. Consideration relating to the choice of accessory equipment shall include: • Use of the accessory equipment in the patient vicinity, • Evidence that the safety certification of the accessory equipment has been performed in accordance with the appropriate IEC 601-1 and IEC 601-1-1 harmonized national standard. In addition all configurations must comply with the medical electrical systems standard IEC 601-1-1. The party that makes the connections acts as system configurator and is responsible for complying with the systems standard. If required contact your local service organization.
	In order to reduce the risk of electric shock, do not remove any covers.
	Caution hot: Keep hands clear from the erasure unit.
	Type B equipment: Indicates that the CR 75.0 complies with the limits for type B equipment.

	Supplementary protective earth connector: Provides a connection between the CR 75.0 and the potential equalization busbar of the electrical system as found in medical environments. This plug should never be unplugged before the power is turned off and the power plug has been removed.
	Intergrounding connector: Provides a connection between the Digitizer and other equipment which might exhibit minor ground potential differences. These differences may degrade the quality of communication between different equipment. Never remove connections to this terminal.
	Protective earth (ground): Provides a connection between the Digitizer and the protective earth of the mains. Do not remove this connection, because this will have a negative influence on the leakage current.
	Power on
	Power off Note that the power cord has to be disconnected from the wall outlet in order to disconnect the unit entirely from the mains.
	Precautions for use in USA only: Make sure that the circuit is single-phase center-tapped, if the Digitizer is connected to a 240 V/60 Hz source instead of a 120 V/ 60 Hz source.

- You can hurt your fingers if they are caught between the ADC Cassette and the edge of the input slot. Insert the cassette in the input buffer as described in *'Reading an image plate'* on page *26*. At all times, keep your fingers clear of the input slot. As soon as the CR 75.0 takes in the cassette, release it.

TÜV safety issues

Accessory equipment connected to the analog and digital interfaces must be certified according to the respective IEC standards (e.g. IEC 950 for data processing equipment and IEC 601-1 for medical equipment). Furthermore all configurations shall comply with the valid version of the system standard IEC 601-1-1. Everybody who connects additional equipment to the signal input part or signal output part configures a medical system, and is therefore responsible that the system complies with the requirements of the valid version of the system standard IEC 601-1-1. If in doubt, consult your local service organization.

Safety instructions for laser products

The CR 75.0 is a Class 1 Laser Product. It uses a 2x50 mW laser diode, classification class IIIb.

Under normal operating conditions - when both doors are closed - there can be no laser radiation outside the CR 75.0. It is nonetheless imperative that the local radiation safety regulations regarding the protection of staff against scattered radiation are complied with, if the CR 75.0 is located in the immediate vicinity of an X-ray room.

Open the front left and right door only to solve cassette or image plate jams. When you open either of the doors, the power supply of all critical components is switched off automatically as a precaution.

Observe the Caution instructions on the Optical module label:

CAUTION!
CLASS 3B LASER RADIATION: WHEN OPEN AVOID DIRECT EXPOSURE TO THE BEAM!
CUIDADO!
RAYO LASER CLASE 3B: EVITAR LA EXPOSICIÓN AL HAZ CUANDO LA TAPA ESTÁ ABIERTA.
VORSICHT !
LASERSTRAHLUNG KLASSE 3B: WENN ABDECKUNG GEÖFFNET NICHT DEM STRAHL AUSSETZEN!
ATTENTION!
FAISCEAU LASER CLASSE 3B: QUAND CAPOT OUVERT ÉVITER DE S´EXPOSER AU RAYÓN!

User interventions other than those described in this manual can be hazardous with regard to laser radiation.

Safety compliance

The CR 75.0 complies with:

- the general safety regulations:
  EN 60601-1:1990+A1:1993+A2:1995,
  IEC 601-1:1988+A1:1991+A2:1995,
  IEC 601-1-1 / EN 60601-1-1,
  EN 60601-1-2:1993,
  UL 2601-1 Second Edition,
  CAN/CSA 22.No.601.1-M909;
- the laser safety regulations:
  EN 60825,
  DHHS/FDA 21 CFR, Parts 1040.10 and 1040.11,
  ANSI Z 136-1980.

Operating modes

The CR 75.0 can be operated in three modes: operator mode, key-operator mode and service mode.

Operator mode

The operator mode groups all basic functions which are aimed at radiographers:

- Reading an image plate;
- Reading an emergency image plate;
- Re-erasing an image plate.

A normal image plate is read automatically after it is placed in the CR 75.0 input buffer; the other functions of the operator mode can be accessed via the keypad. All functions of the operator mode are described in *Chapter 2, 'Basic operation ('Operator mode')'*.

Key-operator mode

The key-operator mode groups advanced functions which are aimed at technicians.

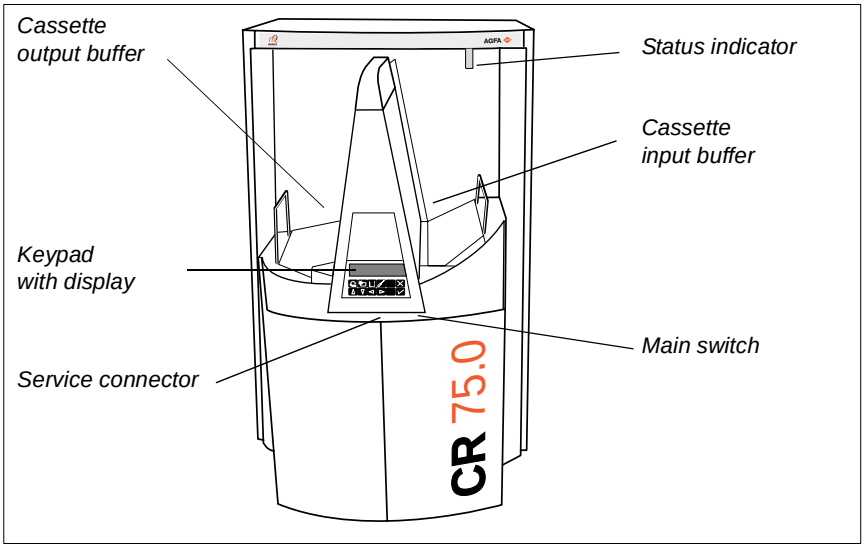
The key-operator mode can be accessed via the Key-operator key on the keypad and is menu-driven. The key-operator functions are described in *Chapter 3, 'Advanced operation ('Key-operator mode')'*.

Service mode

The service mode functions are reserved for trained service personnel. They are password protected.

The user interface

Main components of the Digitizer



The main components of the CR 75.0 are:

- Cassette input buffer

  The cassette input buffer accepts up to 10 cassettes - even of different sizes - for digitizing and up to 9 cassettes for erasure.

- Keypad

  As the handling of the cassettes is fully automated, normal operation is a zero-button operation. The keys on the keypad are only used to activate special functions such as reading an emergency image plate or erasing an image plate.

- Status indicator

  A light indicates the status of the CR 75.0.

- Cassette output buffer

  The cassette output buffer receives cassettes which have been handled by the Digitizer.

The control panel

The control panel of the CR 75.0 consists of a backlit LCD display and 10 keys.

As the handling of the cassettes is fully automated, normal operation is a zero-button operation. Only when you are performing special functions or in the event of problems (e.g. a cassette or image plate jam), you will need the keys.

The keypad

Special functions can be accessed via the keypad. The keypad features the following keys:

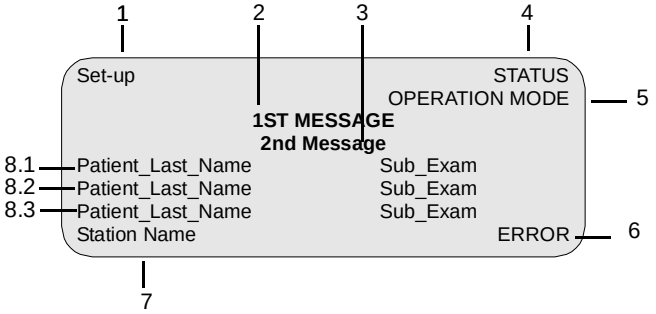
	Emergency key	To give an image the status ‘emergency’ when it is sent to the image processing station.
	Erase key	To erase images without digitizing them. This must be done if: • an image plate has not been used for more than 3 days; • an image plate has been exposed to an exceptionally high X-ray dose.
	Key-operator key	To access advanced functions (‘key-operator functions’).
	Service key	To access service-level functions. Reserved for trained service personnel.
	Escape key	To quit the current function or exit a menu without saving modifications.
	Confirm key	In key-operator mode: • to select a menu. • to accept an entry in a menu and go back to operator mode.

	Up key	• To move the cursor to the previous entry field. • To scroll upwards. • To increment the number in a numeric entry field.
	Down key	• To move the cursor to the next entry field. • To scroll downwards. • To decrement the number in a numeric entry field.
	Left key	• To scroll backwards through multiple choices within a field. • To move the entry position in a numerical entry field from right to left. • To toggle between values in a field.
	Right key	• To scroll forwards through multiple choices within a field. • To move the entry position in a numerical entry field from left to right. • To toggle between values in a field.

The display

The CR 75.0 control panel has a backlit LCD display with 8 lines of 40 characters each. Its lay-out depends on the operating mode.

In **operator mode**, the display has dedicated areas for specific information:



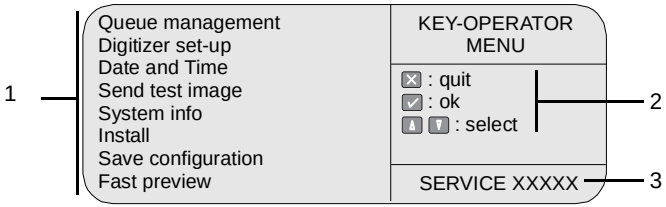
1	Set-up of image processing station: • [blank]: Default image processing station selected. • Off line: Transmission to all image processing stations disabled. • [process.station] not ready: Image processing station not available. • [process.station] rerouted: Images rerouted to other image processing station.
2	Type of message
3	Extra comment or action to take
4	System status: • READY: The CR 75.0 is ready for operation. • BUSY: The CR 75.0 is busy with scanning or erasing. • ERROR: An error has occurred. • LOCKED: id. • WARNING: id.

5	Operation mode: • [blank]: Normal operation mode. • EMERGENCY: Emergency function for image plates with ID data. • ERASURE: Re-erasure function.
6	Error status: service code (SERVICE XXXXX) or error code (CODE XXXXX)
7	Station name of the CR 75.0
	Identifier of image plate being treated:
8.1	After image ID data is read;
8.2	During scanning of image plate and transmittal of image data;
8.3	During transmittal of image data to image processing station.

If the system has been idle for 5 minutes, the backlit LCD display dims. The display lightens if:

- The display message changes, e.g. if the Digitizer receives a message from the image processing station.
- You place a cassette in the input buffer.
- You press a key on the keypad.

In **key-operator mode**, operation is menu driven. The menu displays the key-operator functions, the active keys, and the service code.



1	Key-operator functions
2	Active keys
3	Service code

The status indicator

The light at the top of the CR 75.0 indicates the status of the CR 75.0.

Color	Constant/ Flashing	Status	Action
Green	Constant	Ready.	Proceed.
	Flashing	Busy (treating image plate).	Proceed.
Red	Constant	Error.	• Check display for messages. • Refer to *'General procedure in case of malfunction'* on page *41*.
	Flashing	• Locked or warning. • Power on/self-test in progress. • Key-operator mode. • Service mode. • CR 75.0 not connected to image processing device.	• Check display for messages. • Refer to *'General procedure in case of malfunction'* on page *41*.

Audio signals

The CR 75.0 gives status information via beeps. The length of the beep indicates the response of the system to a key command.

- A **short** beep means that CR 75.0 has accepted the key command and is starting the operation.
- A **long** beep means that you have pressed a non-active key or that the CR 75.0 has rejected the key command.
- An **interval** beep accompanies an error, locked or warning message.

Switching on the CR 75.0

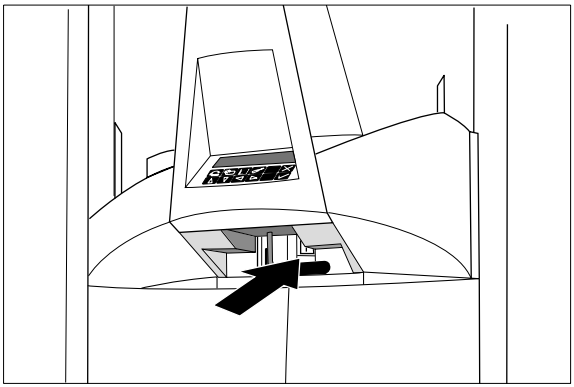
Before switching on

Make sure that the following conditions are met before you switch the CR 75.0 on:

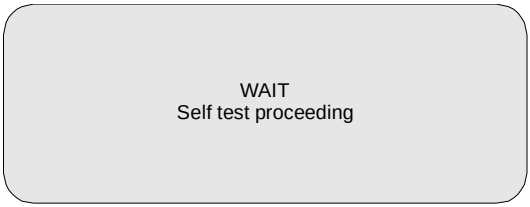
- A service technician has appropriately connected the CR 75.0 and has carried out a performance test.
- You have read the safety precautions at the beginning of this manual and you will observe them while working with the CR 75.0.
- You are acquainted with the basic functions of the Digitizer.

Switching on the CR 75.0

Locate the main switch and place it in position ‘ON’.



After the Digitizer has been switched on, the following screen is displayed:

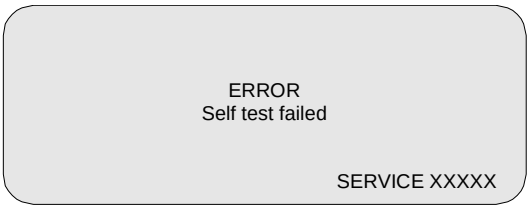


The CR 75.0 executes a self-test, initializes all the Digitizer components, goes through a start-up procedure and checks for cassettes, image plates and images still to be transmitted in the image queue. During this stage, the status indicator is red and flashing.

If the CR 75.0 has completed the self-test successfully, the CR 75.0 enters the operator mode and displays the main operator screen:

The status indicator is constant green. The CR 75.0 is ready for use.

❖ *If the CR 75.0 displays:*



An error has occurred during the self-test. Refer to Chapter 3, 'Advanced operation ('Key-operator mode')'.

Switching off the CR 75.0

Before switching off

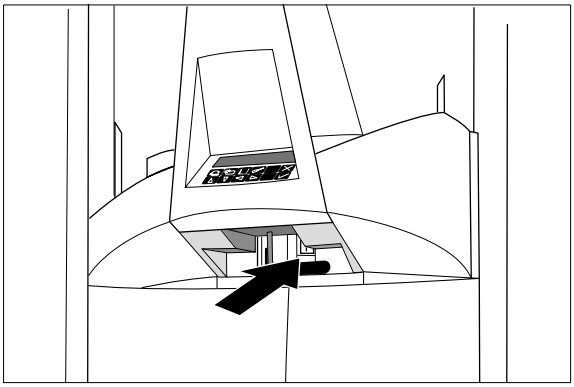
Check that the CR 75.0 is not scanning an image plate. If the CR 75.0 is scanning an image plate, the status indicator at the top of the machine is green and flashing.

Switching off

It is recommended to switch off the CR 75.0 at the end of the day.

Only switch off the CR 75.0 if you do not intend to digitize emergency image plates overnight. Switching on the CR 75.0 takes a few minutes. During this time emergency digitizing is not possible!

Place the main switch in position ‘OFF’.



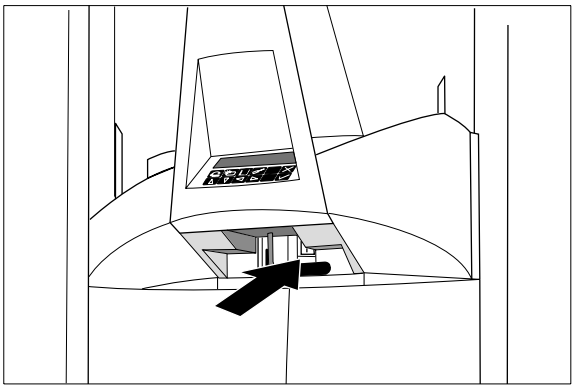
Resetting the CR 75.0

In exceptional circumstances you may be prompted to reset the CR 75.0, either by a message on the keypad or as part of a troubleshooting procedure in this manual.

Never reset the Digitizer to solve a plate or cassette jam. If you would do so, the plate inside the Digitizer might get damaged. In case of a plate or cassette jam, always follow the procedures described in Chapter 4, 'Preventive maintenance and troubleshooting' of the Reference manual.

To reset the Digitizer:

1 Locate the main switch and place it in position 'OFF'.



2 Wait 30 seconds.

3 Place the main switch in position 'ON'.

Chapter 2

Basic operation (‘Operator mode’)

This chapter provides basic information on how to digitize image plates under normal conditions and in emergency situations. It also treats how to erase an image plate to prevent ghost images caused by previous exposures or by scattered radiation. These functions are available in operator mode.

- ❑ Reading an image plate
- ❑ Reading an emergency image plate
- ❑ Re-erasing an image plate

Reading an image plate

The main function of the CR 75.0 is digitizing image plates and transmitting the digital image data to the preview station and the image processing station.

To read one or more image plates:

1 Make sure the cassette has been properly identified via the ID Station.

Refer to the User manual of the ID Software.

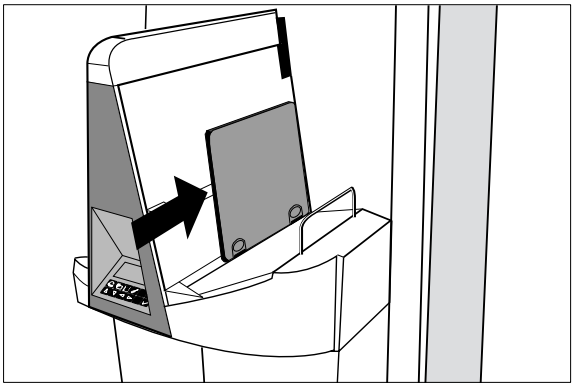
2 Check that the CR 75.0 is ready for operation:

- the CR 75.0 must display the operator screen with ‘Ready’ or ‘Busy’ status.

- the status indicator at the top of the CR 75.0 must be constant or flashing green.

❖ *The CR 75.0 is operational if the status field equals ‘READY’, even if status messages of the destination are shown (e.g. ‘VIPS not ready’).*

3 Place one or more cassettes in the input buffer.



You can insert up to 10 cassettes, even of different sizes. Make sure that the cassette opening mechanism is at the bottom.

The Digitizer automatically takes in the first cassette, reads the image plate, and forwards the digital image data to the preview station for fast precheck and to the image processing station for image processing.

If fast preview is enabled, the CR 75.0 transmits the digital image data in blocks of typical 100 lines to the preview station.

When the CR 75.0 has treated the cassette, it displays the operator main screen.

4 Remove the cassette(s) from the output buffer.

When the CR 75.0 returns the cassette, it is ready to be re-used immediately. However, if you leave it for more than 3 days before re-using it, you must re-erase it first. Refer to 'Re-erasing an image plate' on page 32.

Reading an emergency image plate

You may have an image plate which you wish to give priority over other image plates which are being processed by the image processing station. Such image plates are referred to as 'emergency image plates'.

The emergency status will only be assigned to the first image plate which you insert into the CR 75.0 cassette slot after pressing the Emergency key.

To read an emergency image plate:

1 Check that the CR 75.0 is ready for operation:

- the CR 75.0 must display the operator screen with ‘Ready’ or ‘Busy’ status.

- the status indicator at the top of the CR 75.0 must be constant or flashing green.

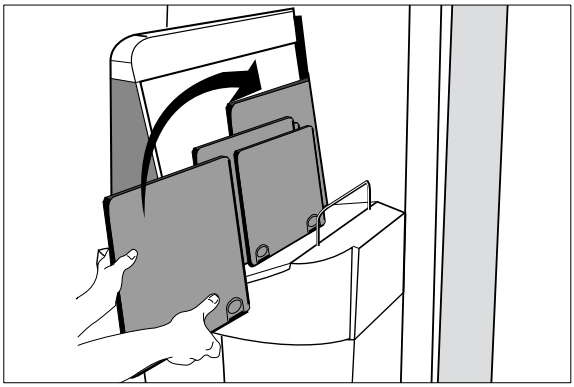
❖ *The CR 75.0 is operational if the status field equals ‘READY’, even if status messages of the destination are shown (e.g. ‘VIPS not ready’).*

2 Press the Emergency key on the keypad.

The display will read:

3 Place the cassette you want to give emergency status first in the stack of cassettes in the input buffer.

❖ *Do not place the cassette with emergency status in the stack while the input mechanism is busy getting a cassette from the stack.*



❖ *If you do not enter a cassette within 1 minute after pressing the Emergency key, the CR 75.0 will quit the emergency function and return to the operator main screen.*

If fast preview is enabled, the CR 75.0 transmits the digital image data in blocks of typical 100 lines to the preview station.

When the CR 75.0 has read the identification data of the emergency cassette, it displays the operator main screen. The Digitizer resumes processing the remaining cassettes in the cassette input buffer.

If you decide not to assign emergency status to a cassette after having pressed Emergency, you can quit the Emergency function by either pressing Escape or by pressing the Emergency key a second time (‘toggle’ key).

❖ *If a ‘WARNING’ or ‘LOCKED’ message is displayed during the Emergency procedure, the CR 75.0 will not quit the Emergency mode. Refer to the Reference manual.*

4 Remove the cassette from the output buffer.

Re-erasing an image plate

At the end of a normal or emergency digitizing cycle, the CR 75.0 returns an erased image plate. However, in the following cases, you must re-erase the image plate before re-using it in order to prevent ghost images from interfering with the image of interest:

- If the image plate has not been used for more than 3 days.
  In this case, the image plate may have been exposed to scattered radiation.
- If an image plate has been exposed to an exceptionally high X-ray dose.
  In this case, deep layers of the image plate may still retain a latent image after standard erasure. Leave the image plate to rest at least one day before re-erasing it.

You can erase image plates which you have given the status ‘to be erased’ via the ID Station or image plates which have the status ‘erased’. You can erase an image plate or a batch of up to 9 plates.

Re-erasing image plates with status 'erased'

To erase one or more image plates which have been erased as part of a normal or emergency digitizing cycle:

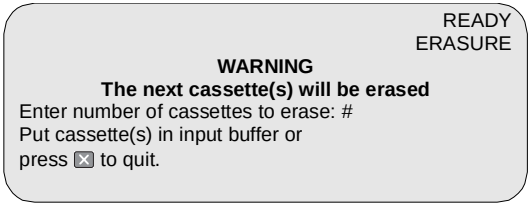
1 Check that the CR 75.0 is ready for operation:

- the CR 75.0 must display the operator screen with 'Ready' or 'Busy' status.

- the status indicator at the top of the CR 75.0 must be constant or flashing green.

2 Press the Erase key on the keypad.

The display will read:

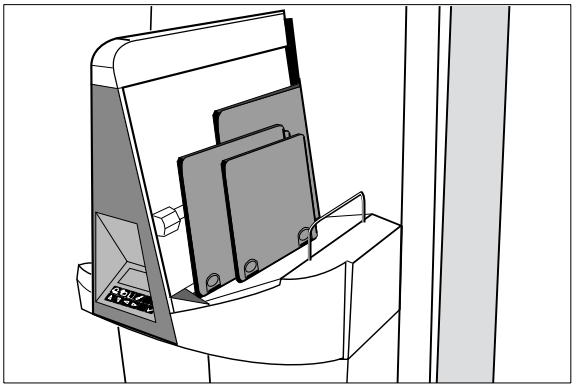


3 Use the Up and Down keys to set the number of image plates to be erased. The default value is 1; the maximum is 9.

4 Place the cassettes which you want to erase in the cassette input buffer.

After a cassette has been erased, the # digit on the display decreases.

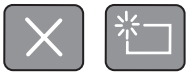
While erasing, the CR 75.0 will still display the above screen and the status indicator will be green flashing. When the CR 75.0 has erased the image plate, it displays the operator main screen.



You can now add (exposed) cassettes to the batch of cassettes. The Digitizer will only erase as many cassettes as you have specified.

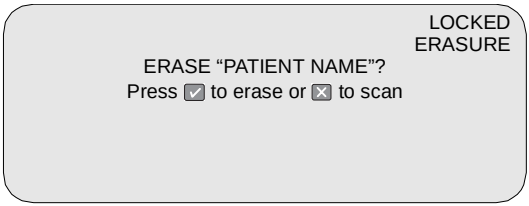
If you place fewer cassettes in the cassette input buffer than you have specified, the Digitizer will erase the cassettes in the buffer and revert to normal mode after a time-out of 1 minute.

You can quit the Erase function by either pressing Escape or by pressing the Erase key a second time (‘toggle’ key).



Warning

If the above screen is not displayed but the display reads:

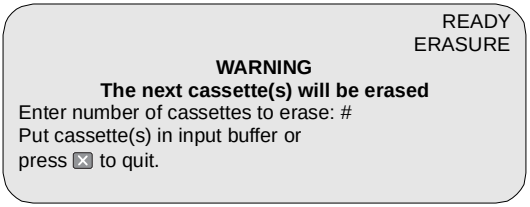


you have entered an identified cassette not having the status ‘erased’. You now have the choice: either cancel erasing or erase the image plate.

- To cancel erasing and make a regular scan: press the Escape key.

- To erase the image plate: press the Confirm key.

While erasing, the CR 75.0 will display:



When the CR 75.0 has erased the image plate, it displays the operator main screen.

5 Remove the cassette(s) from the output buffer.

Re-erasing image plates with status ‘to be erased’

To re-erase one or more image plates which you have given the status ‘to be erased’ via the ID station:

1 Check that the CR 75.0 is ready for operation:

- the CR 75.0 must display the operator screen with ‘Ready’ or ‘Busy’ status.

- the status indicator at the top of the CR 75.0 must be constant or flashing green.

2 Place the cassettes in the input buffer.

The CR 75.0 will automatically erase the image plates. The display will read:

When the CR 75.0 has erased the image plates, it displays the operator main screen.

3 Remove the cassette(s) from the output buffer.

Chapter 3

Advanced operation (‘Key-operator mode’)

This chapter gives an overview of the key-operator functions, preventive maintenance actions and troubleshooting. For detailed information on these topics, refer to the Reference manual.

- ❑ Survey of advanced functions
- ❑ Preventive maintenance
- ❑ General procedure in case of malfunction
- ❑ Troubleshooting
- ❑ Clearing cassette jams
- ❑ Clearing image plate jams

Survey of advanced functions

A survey of the functions which are available in key-operator mode is given below. For detailed information, refer to *Chapter 3, 'Advanced operation ('Key-operator mode')'* of the CR 75.0 Reference manual.

Function in key-operator main menu	Section in Reference manual	Page
Queue management	*'Consulting the images in the queue'*	*38*
Digitizer set-up	*'Customizing the CR 75.0 ('Digitizer set-up')'*	*42*
Date and Time	*'Setting the date and time'*	*48*
Send test image	*'Sending test images'*	*49*
System info	*'Consulting information on the CR 75.0'*	*50*
Install	*'Installing a new software version'* *'Installing a new language'* *'Installing new customer parameters'*	*54* *59* *64*
Save configuration	*'Saving the configuration data on a diskette (backup)'*	*70*
Fast preview	*'Enabling/disabling fast preview'*	*73*

Preventive maintenance

The CR 75.0 is designed for trouble-free service. Maintenance and cleaning involve only some minor user tasks. Refer to the User manual for more information.

Interval	What to do?	Page
Ad hoc	*'Cleaning the exterior'*	*40*

Safety guidelines

To prevent damage to the Digitizer while cleaning, observe the following safety precautions:

- Do not lubricate the Digitizer.
- Do not attempt to disassemble the Digitizer.
- Always switch off the CR 75.0 and disconnect the power cord from the outlet before carrying out any cleaning work.

Cleaning the exterior

❖ *Do not open the machine for cleaning. No components inside the machine require maintenance or cleaning by the user.*

1 Switch off the Digitizer by following the procedure as described in *'Switching off the CR 75.0'* on page *23*.

2 Remove the power plug from the socket.

3 Wipe the exterior of the Digitizer with a clean, soft, damp cloth.

Use a mild soap or detergent if required but never use an ammonia–based cleaner.Be careful not to get any liquid in the power cord port.

⚠ ***Take extreme care that no water infiltrates the machine !***

4 Plug in the Digitizer and switch it on by following the procedure as described in *'Switching on the CR 75.0'* on page *21*.

General procedure in case of malfunction

In exceptional situations the CR 75.0 display provides comprehensive information concerning errors and ways of correcting them. The Digitizer status changes from ‘READY’ to one of the following:

Message	Status indicator	Meaning	Action
Warning	Red flashing	Further operation is possible without impairing the image quality.	Follow the instructions on the display. The warning disappears as soon as the problem has been solved.
Locked	Red flashing	The Digitizer no longer takes cassettes from the input buffer. You can solve this problem without resetting the Digitizer.	Follow the instructions on the display.
Error	Constant red	This status normally requires service or key operator intervention.	Follow the instructions on the display.

Never reset the Digitizer to solve a cassette or image plate jam nor to solve communication problems with the image processing station.

Troubleshooting

A survey of errors is listed below. For more detailed information, refer to the Reference manual.

To	Refer to section	Page
Solve 'SERVICEXXXXX' errors	*'Solving the 'ERROR' status'*	*78*
Solve 'ERRORXXXXX' errors		

Clearing cassette jams

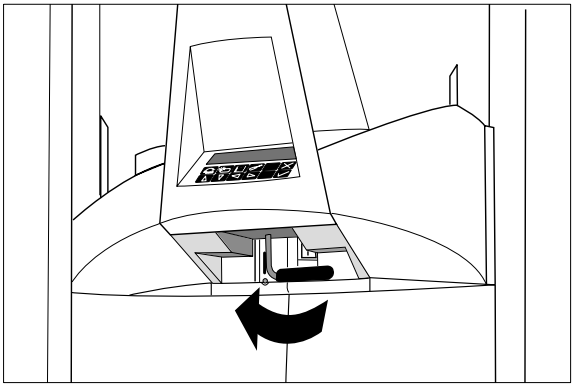
A cassette can get jammed when the CR 75.0 takes in a cassette or when it returns a cassette to the output buffer. If this is the case, you see part of the cassette either in the input buffer or in the output buffer.

To clear a cassette jam:

1 Switch off the CR 75.0.

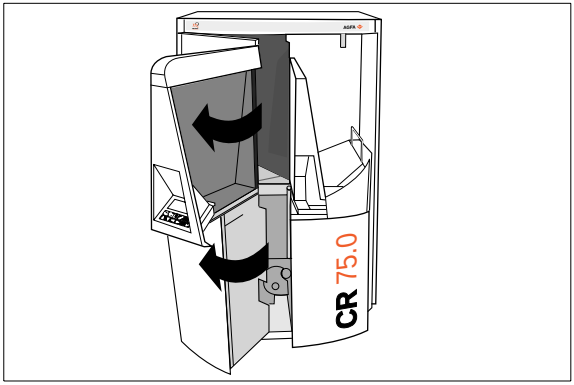
Refer to *'Switching off the CR 75.0'* on page *23*.

2 Push the black handle located under the control panel gently to the left to unlock the front doors of the CR 75.0.

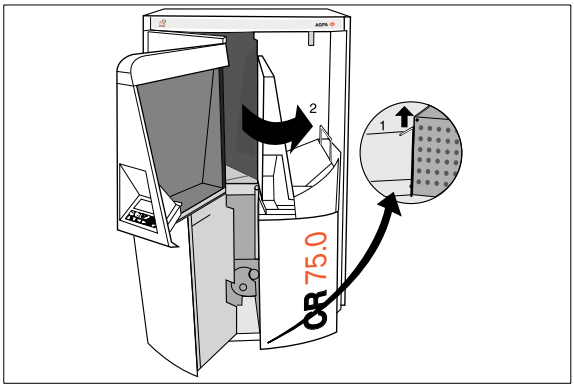


3 Open the left front door of the Digitizer.

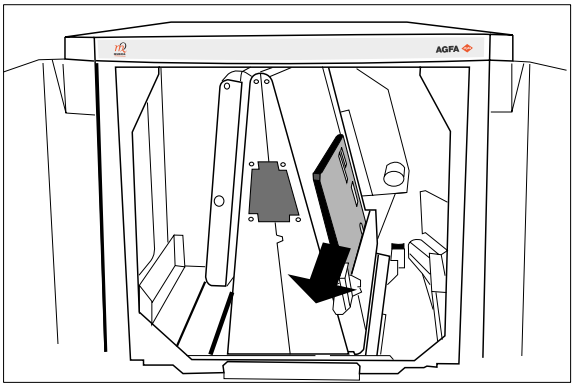
Make sure you open the left front door first. When you open the left front door, the power supply of all critical components is switched off automatically.



4 Lift the bottom door bolt and open the right front door.

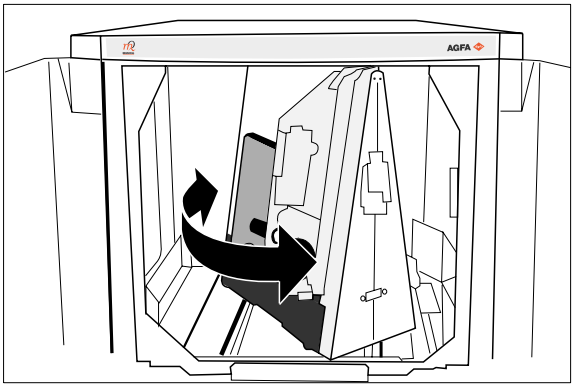


5 Gently remove the jammed cassette.



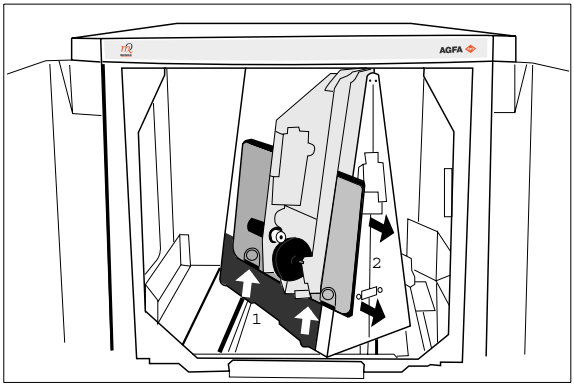
If the cassette is jammed in the output slot, the cassette might be hard to reach. In this case, continue with steps **6** to **7**.

6 If the cassette is jammed in the output slot and is hard to reach, swivel the cassette unit anti-clockwise.



7 Remove the cassette by pulling it towards you [2] while gently lifting it upwards [1].

If you cannot easily remove a cassette at this point, do not dismantle the unit any further. Contact your local service organization.



8 Close the front doors.

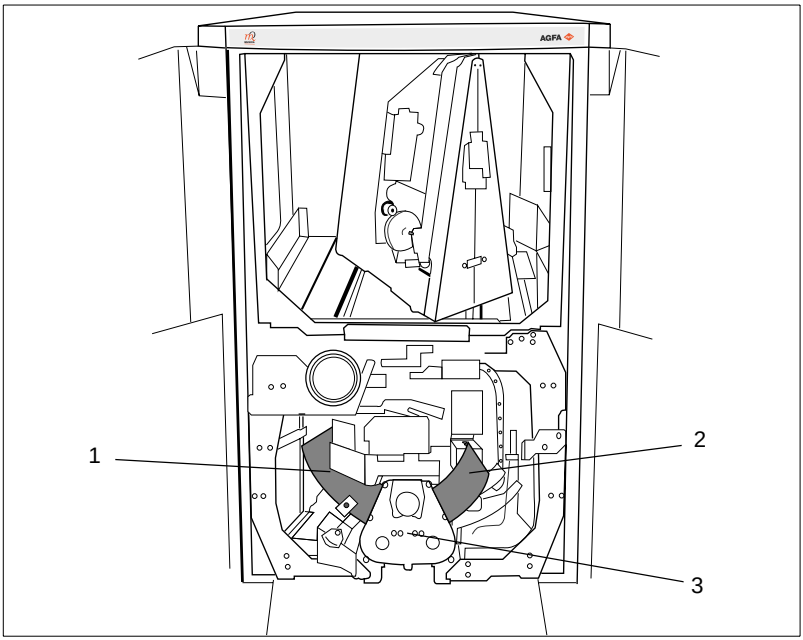
The CR 75.0 will restart automatically.

After start-up, the operator main screen is displayed.

Clearing image plate jams

The CR 75.0 always reads and digitizes the plate first, then erases it and feeds it to the output buffer. If a plate jam occurs before the plate is scanned, there is a fair chance that you can recover the image by putting the image plate back into the cassette and digitizing it again. While handling the image plate, prevent exposing it to daylight as much as possible.

The diagram below shows the possible locations of a jammed image plate and the probable status of the image.



	Status	Action
1	Plate jam in the post-scan unit. Image is OK.	Erase the image plate.
2	Plate jam in the pre-scan unit. Image plate is not erased but cassette status is set to ‘erased’.	**1** Re-identify cassette via ID Station. **2** Digitize cassette.
3	Plate jam in the scanner. Cassette status is set to ‘erased’. Image is damaged.	**1** Erase the image plate. **2** Redo the patient exam.

To clear an image plate jam:

1 Remove the cassette.

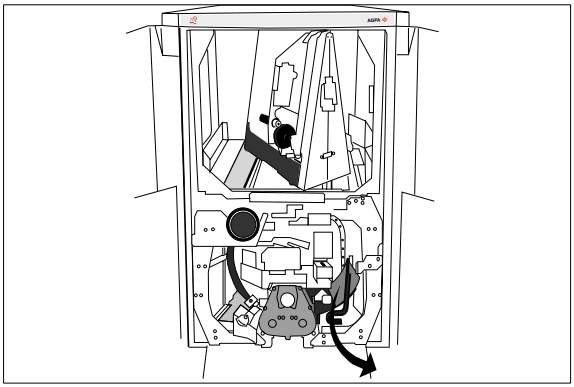
Refer to *‘Clearing cassette jams’* on page *43*.

2 Check whether the image plate is jammed in the pre-scan or in the post-scan unit.

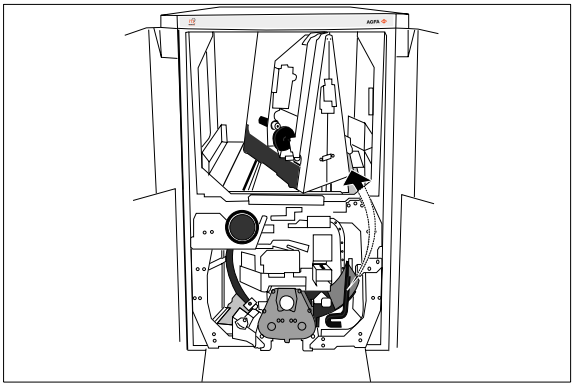
Refer to the diagram above.

- If the image plate is jammed in the pre-scan unit, continue with step **3**.
- If the image plate is jammed in the post-scan unit, continue with step **4**.

3 If an image plate is jammed in the pre-scan unit, remove the jammed image plate by pulling it carefully towards you.

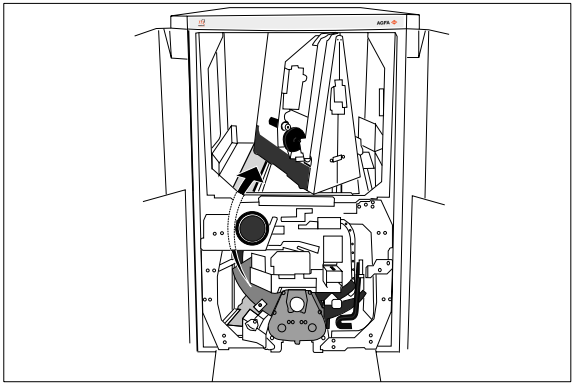


If the image plate cannot be removed by pulling it towards you, lift the jammed plate and remove it through the upper part of the Digitizer.



4 If an image plate is jammed in the post-scan unit, try to remove the jammed image plate by pulling it carefully towards you.

If the access is too narrow, lift the jammed plate over the erase unit and remove it through the upper section of the Digitizer.



If it is still not possible to remove the image plate, do not dismantle the unit any further. Contact your local service organization.

5 Close the front doors.

The CR 75.0 will restart automatically.

After start-up, the operator main screen is displayed.

Appendix A

Equipment information sheet

Specifications

Product description	
Type of product	Digitizer
Commercial name	CR 75.0
Model number	5146/101
Original seller/manufacturer	Agfa-Gevaert NV-Mortsel
Labelling	
CE/TÜV	93/42 EEC ‘Medical Device Directive’ (Europe), EN 60601-1, VDE 0750
UL	UL certified, UL 2601-1 Second Edition (North America)
cUL	cUL certified CSA 22.2 No.601.1 (Canada)
Dimensions	
Length	• at cassette buffer: 1141 mm • at foot: 840 mm
Width	840 mm
Height	1420 mm
Weight	
Unpacked	320 kg
Power consumption	
Standby	approx. 300 W
Maximum	approx. 1700 W (=8.5 A)
Self-adapting power supply range	• 200 V (-10%) to 240 V (+10%) • 50-60 Hz

Environmental requirements	
Room temperature	20°C - 30°C
Maximum temperature change	0.5°C/min.
Relative humidity	10% - 80%
Magnetic field	Less than 5 Gauss; compliant with EN 61000-4-8, Level 5
Sunlight exposure	Not to be operated in full sunlight
Physical emissions	
Noise emission (sound power level according to DIN 45635 Part.27)	
• During scanning	max. 65 dB(A)
• Standby	max. 46 dB(A)
Heat emission (at max. throughput with 35 cm x 43 cm image plates)	
• Europe	0.8 kWh
• US	2730 BTU/hr
Cassette buffer capacity	
10 cassettes of mixed sizes, both in input and output buffer	
Performance	
Throughput for high resolution	115 plates/h (size dependent)
Throughput for standard resolution	115 plates/h (size dependent)
Grayscale resolution	
Data acquisition	12 bits/pixel
Output to processor	12 bits/pixel

Spatial resolution	
35 x 43 cm (14 x 17”) HR	10 pixels/mm
35 x 43 cm (14 x 17”) SR	7 pixels/mm
21 x 43 cm HR	10 pixels/mm
35 x 35 cm (14 x 14”) HR	10 pixels/mm
35 x 35 cm (14 x 14”) SR	7 pixels/mm
30 x 24 cm HR	10 pixels/mm
24 x 18 cm HR	10 pixels/mm
30 x 15 cm HR	10 pixels/mm
10 x 8” HR	10 pixels/mm
12 x 10” HR	10 pixels/mm
Scan area (scan width x scan length)	
HR: High resolution; SR: Standard resolution	
35 x 43 cm (14 x 17”) HR & SR	348 x 424 mm
21 x 43 cm HR	202 x 424 mm
35 x 35 cm (14 x 14”) HR & SR	348 x 348 mm
30 x 24 cm HR	292 x 232 mm
24 x 18 cm HR	232 x 172 mm
30 x 15 cm HR	292 x 142 mm
10 x 8” HR	246 x 195 mm
12 x 10” HR	297 x 246 mm

Appendix B

ADC Compact cassette

Safety precautions

Observe great care whenever removing the image plate from the ADC Compact cassette. Refer to the cleaning procedure described further on in this manual.

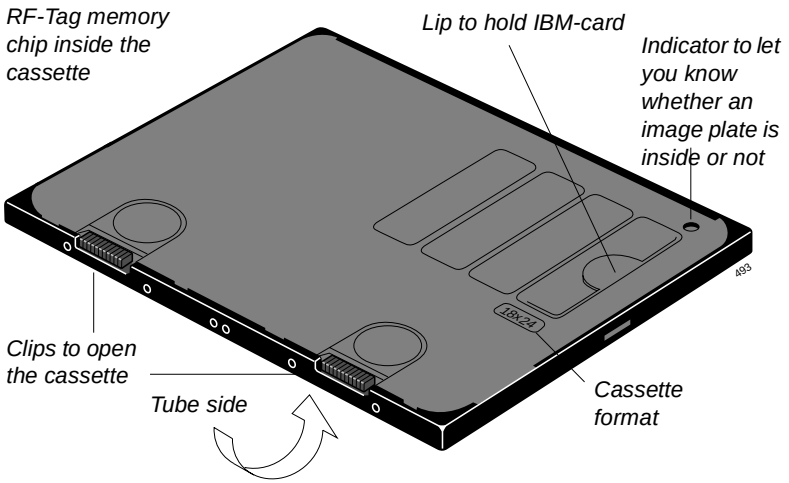
⚠ ***Make sure that the automatic exposure control device is placed above the cassette, to prevent patients from receiving an overdose of X-rays. When it is located underneath the cassette, the backscatter protection (lead) contained in the red side of the cassette, retains a certain amount of X-rays. The dose measured by the cell will then be much lower than the dose actually given to the patient.***

❖ *The image plate causes a specific X-ray scattering. This influences the response of the exposure control device. To compensate for this, recalibration of the device for the use with ADC Compact cassettes could be necessary.*

Description of the ADC Compact cassette

The ADC Compact cassette and plate are compatible with existing X-ray tables. The exposure equipment and routines do not have to be modified when switching from conventional to digital imaging. Although compatible with existing X-ray equipment, an ADC Compact cassette is quite different from a conventional cassette. The most important difference lies inside, in the image receptor.

ADC Compact cassettes and ADC 70 cassettes are not interchangeable. But the same image plates can be used for both.


RF-Tag memory chip inside the cassette
Lip to hold IBM-card
Indicator to let you know whether an image plate is inside or not
Clips to open the cassette
Tube side
Cassette format
18x24
493

Embedded memory

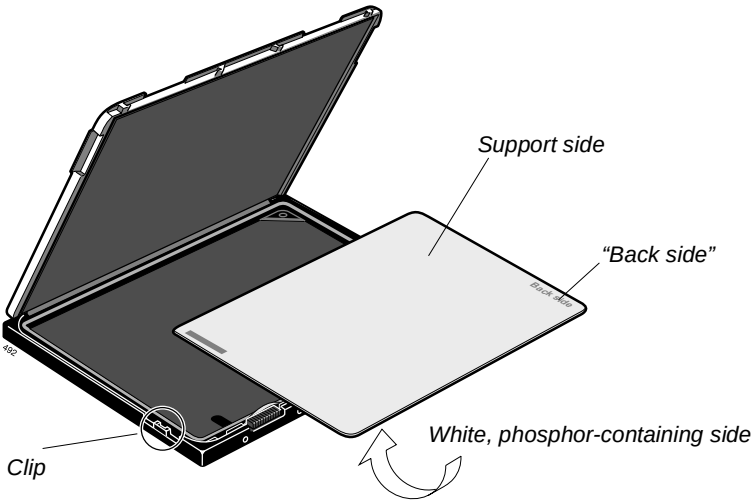
The main difference lies in the RF-tag memory chip that is permanently mounted in the cassette. Using the ADC ID Software you can enter patient demographics and examination data into the memory chip. The identification of this data is performed by no-touch radiofrequency tagging via a built-in antenna card in the ADC Compact cassette.

Image plate

Another difference between an ADC Compact cassette and a conventional cassette is the X-ray sensitive element (image receptor). The latter is no longer a film, but an image plate that can be re-used thousands of times.

The way in which this image plate is placed into the cassette is of great importance. The side containing the white phosphor must be oriented towards the black tube side of the cassette. The support side (indicated by the text “back side“) is then oriented towards the red side of the cassette, as shown in the illustration below.

The ‘clips’ mounted on the cassette prevent the cassette from being opened by a conventional daylight system such as the Curix Capacity (Plus), so that even in hybrid conventional/digital departments the occurrence of errors is avoided.



Cleaning the image plate

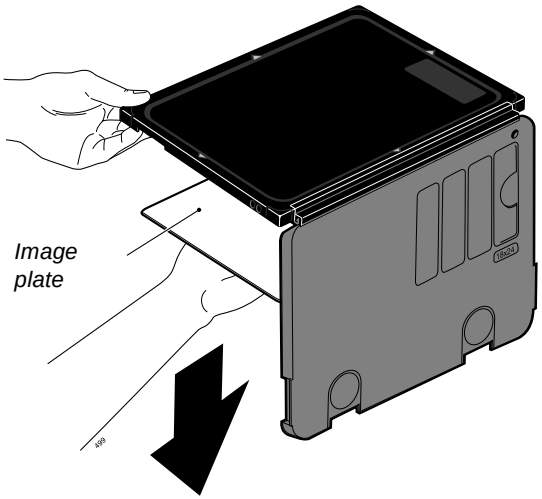
The inner lining of the ADC Compact cassette body is made of Bayer Makrolon polycarbonate. This ensures a high degree of protection against electrostatic charging and dust collection on the ADC image plates. Nonetheless, it is recommended to clean the image plates once a month using the following procedure:

1 Open the cassette with the red side up.

2 Put your hand on the image plate with the cassette in a horizontal position. Make sure that you do not press on the plate.

3 Turn the cassette over, holding the image plate in position with your other hand.

4 Take away the cassette. The image plate remains lying on your hand.



5 When necessary, clean extreme contamination with ADC Digital Screen Cleaner.

6 Moisten a cellulose cloth (non-fluffy) with the cleaning agent.

7 Rub the cleaner softly and evenly over the whole surface of the screen.

8 Leave the cassette with the clean screens open for approximately 10 minutes to enable the solvent to evaporate.

9 Reassemble the cassette.

Make sure that the white side of the image plate, containing the phosphor, is oriented towards the (black) tube side of the cassette.

Ensure that the image plate is within the flange on the inside of the cassette. If you put the image plate into the cassette differently, e.g. if the image plate lies partly in between the hinge of the cassette, it can be irreparably damaged.

Cleaning the cassettes

When necessary, you can clean the outside of the ADC cassettes with soft water and soap or a detergent solution, with ADC Digital Screen Cleaner or with benzine. The inside should always be cleaned with ADC Digital Screen Cleaner.

Never clean the cassette with ethyl alcohol, methyl alcohol or diethylic ether.

Technical specifications of the cassettes

Sizes

- 35 x 43 cm (14 x 17"),
- 35 x 35 cm (14 x 14"),
- 24 x 30 cm,
- 18 x 24 cm,
- 8 x 10",
- 10 x 12",
- 21 x 43 cm (by partial scan of dedicated 35 x 43 cm cassettes),
- 35 x 43 cm HR high resolution cassette,
- 35 x 35 cm HR high resolution cassette,
- 15 x 30 cm dental cassette.

Standards

- DIN 6832 part 1 & 2
- ANSI/NAPM IT 1.49-1995
- IEC 406 (draft 1995)

Weight

- 35 x 43 cm typical 1.6 kg

Material

Body	ABS (Acrylonitryl Butadiene Styrene)
Corners	Polyurethane Rubber (PUR)
Hinge	Polypropylene (PP)
Inner lining	Makrolon

Identification

- Memory chip (RF-tag card) embedded in the cassette

Backscatter protection

- 150 μ lead

Technical specifications of the image plates

Sizes

- 35 x 43 cm (14 x 17")
- 35 x 35 cm (14 x 14")
- 24 x 30 cm
- 18 x 24 cm
- 8 x 10"
- 10 x 12"
- 15 x 30 cm

Plate construction

Protective layer	Electron beam cured polymer
Phosphor	BaSrFBrI:Eu
Base	P.E.T.

Characteristics

Its luminescence spectrum is the typical Eu^{2+} -luminescence, which is at around 390 nm in lattices of the BaFBr-type. The top in the luminescence spectrum is shifted slightly to longer wavelengths due to the incorporation of iodide.

The stimulation spectrum is much broader than that of pure BaFBr and is shifted to longer wavelengths. This shift is caused in the first place by the partial replacement of Ba by Sr, and in the second place by the incorporation of iodide. Thanks to the red-shift of the stimulation spectrum, maximum stimulability is assured at 633 nm, the wavelength of the stimulating laser.

The Agfa phosphor has excellent dark decay characteristics. Two hours after exposure, approximately 80% of the energy stored upon exposure is still available. The image retention is greater than 50% up to 24 hours after irradiation.

CE

Printed in Belgium
Published by Agfa-Gevaert N.V., B-2640 Mortsel-Belgium
2242A EN 20040303

AGFA